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HIGH-CUBE WAREHOUSE/ DISTRIBUTION CENTER BLOOMINGTON, CA

County of San Bernardino

Prepared by:



DAVID EVANS
AND ASSOCIATES INC.

FINAL REPORT
July 19, 2016



July 19, 2016

Job No. THFY0000 - 0101

Mr. Julien Hoisington
Thrifty Oil Company
13116 Imperial Highway
Santa Fe Springs, CA 90670

**RE: Traffic Impact Study – High-Cube Warehouse/Distribution Center
Bloomington, California, San Bernardino County**

Dear Mr. Hoisington;

David Evans and Associates, Inc. is pleased to submit this Final Traffic Impact Study (TIS) Report for the proposed High-Cube Warehouse/Distribution Center. The Proposed Project is an approximate 371,422 square-foot facility on an approximate 19 acre site. The Proposed Project is located at the northwest corner; of Orange Street and Cedar Avenue in the unincorporated community of Bloomington, California, San Bernardino County.

The report examines the traffic impacts specifically for the project and presents recommended traffic improvements. The report also addresses the impacts of overall growth within the area to assure that cumulative traffic mitigations can be addressed.

We are pleased to have been of assistance to you in processing and obtaining approval for the project. If you have any questions or comments, please feel free to contact me at 760-524-9115.

Respectfully submitted,

David Evans and Associates, Inc.


Robert A. Kilpatrick, P.E., T.E.
Senior Project Manager / Senior Associate



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1 INTRODUCTION

This report identifies the traffic impacts and presents recommendations for access and traffic mitigation for the Proposed Project Bloomington High-Cube Warehouse/Distribution Center. The Proposed Project is an approximate 371,422 square-foot facility, on an approximate 19 acre site, located at the northwest corner of Orange Street and Cedar Avenue in the unincorporated community of Bloomington, California, San Bernardino County. *Figure 1* illustrates the vicinity map and project location and *Figure 2* illustrates the proposed project site plan. The Proposed Project is bounded to the north by the I-10 Freeway and Union Pacific Railroad, Orange Street to the south, Linden Avenue to the west, and Cedar Avenue to the east.

The intent of this Traffic Impact Study (TIS) is to address the impacts and mitigations required for the proposed development. This report identifies six (6) study scenarios. The scenarios include an Existing Condition, Year 2016 Ambient Condition, Year 2016 Ambient and Proposed Project Condition, Year 2016 Cumulative Condition, Year 2035 Ambient Condition, and Year 2035 Ambient and Proposed Project Condition.

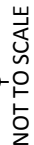
The Year 2016 Ambient Condition addresses impacts due to ambient growth up to the Opening year 2016 within the study area. The ambient growth is estimated as an annual 1.1% growth rate. The Year 2016 Ambient Condition considers a trip distribution utilizing existing intersections included in the study area. The County of San Bernardino in conjunction with California Department of Transportation (Caltrans) has scheduled improvements to the Cedar Avenue/I-10 Freeway Interchange.

The Year 2016 Ambient and Proposed Project Condition addresses impacts due to Project Traffic and ambient growth up to the Opening year 2016 within the study area. Project specific impacts are identified based on the San Bernardino County Road Planning and Design Standards Section 10.12 Part D Significant Impact (Current Traffic Study Guideline) and the County of San Bernardino Interim Traffic Impact Study Guidelines (Interim Traffic Impact Study Guideline).

The Year 2016 Cumulative Condition addresses impacts due to Cumulative Traffic (produced by Other Area Projects), Project Traffic, and ambient growth up to the Opening year 2016 within the study area. The other area project trips were provided by San Bernardino County Planning, the City of Fontana, and the City of Rialto. Year 2016 Regional Mitigations are identified based on the San Bernardino County Road Planning and Design Standards Section 10.12 Part D Significant Impact (Current Traffic Study Guideline) and the County of San Bernardino Interim Traffic Impact Study Guidelines (Interim Traffic Impact Study Guideline).

The Year 2035 Ambient Condition addresses impacts due to ambient growth up to the Buildout Year 2035 within the study area. The ambient growth up to the Buildout Year 2035 was developed from the San Bernardino Transportation Analysis Model (SBTAM) Traffic Model.

The Year 2035 Ambient and Proposed Project Condition addresses impacts due to Project Traffic and ambient growth up to the Buildout Year 2035 within the study area.



VICINITY MAP

HIGH-CUBE WAREHOUSE/DISTRIBUTION CENTER BLOOMINGTON, CALIFORNIA

FIGURE

1



2

2 EXISTING CONDITION

Existing Street System

The following roadways provide access to and within the study area;

Valley Boulevard is an east-west arterial that parallels the I-10 Freeway. It is a four lane roadway (two in each direction with a raised median) with traffic signals and left turn channelization at major intersections. Valley Boulevard is identified as a major highway on the Bloomington Community Circulation Plan.

Cedar Avenue is a north-south roadway identified as a CMP Roadway on the San Bernardino County CMP, 2003 Update. It is a four lane roadway (two in each direction with two-way left turn lane or a raised median) with traffic signals and left turn channelization at major intersections. Cedar Avenue is identified as a major highway on the Bloomington Community Circulation Plan.

Orange Street is an east-west local roadway. It is a two lane roadway (one in each direction) providing limited parking throughout the study area. Orange Street is identified as a City Street on the Bloomington Community Circulation Plan.

Slover Avenue is an east-west roadway. Slover Avenue alternates between a two lane roadway (one in each direction) and a four lane roadway (two in each direction) with traffic signals and left turn channelization at major intersections. Slover Avenue is identified as a major highway on the Bloomington Community Circulation Plan.



The Proposed Project proposes to construct two driveways on Cedar Place, one (1) driveway on Orange Street, and two (2) driveways on Linden Avenue.

The Proposed Project is located at the northwest corner of Orange Street and Cedar Avenue in the unincorporated community of Bloomington, California, San Bernardino County. Based on potential traffic impacts to the area roadways and coordination with the County of San Bernardino, eight (8) intersections have been identified for analysis;

1. Cedar Avenue and Valley Boulevard
2. Cedar Avenue and I-10 Westbound Ramps
3. Cedar Avenue and I-10 Eastbound Ramps
4. Cedar Avenue and Cedar Place
5. Cedar Avenue and Orange Street
6. Cedar Avenue and Slover Avenue
7. Project Driveway and Orange Street*
8. Linden Avenue and Slover Avenue

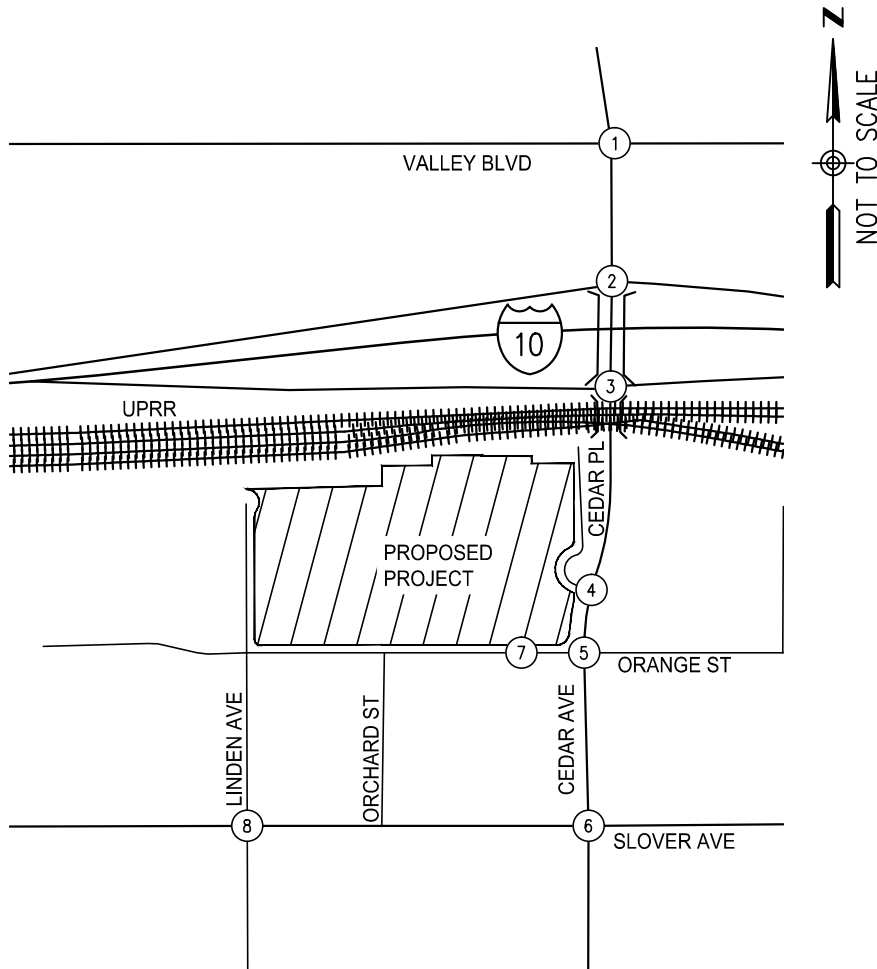
The intersections of Cedar Avenue and Valley Boulevard, Cedar Avenue and I-10 Westbound Ramps, Cedar Avenue and I-10 Eastbound Ramps, Cedar Avenue and Orange Street, and Cedar Avenue and Slover Avenue are signalized. The intersections of Cedar Avenue and Cedar Place, Project Driveway and Orange Street, and Linden Avenue and Slover Avenue are stop controlled. The intersections denoted with an asterisk (*) are future intersections.

Existing Traffic Volumes

Figure 3 illustrates the existing peak hour traffic volumes in the study area. Turn movement counts were provided by Minagar and Associates for the intersections of Cedar Avenue and I-10 Eastbound Ramps, Cedar Avenue and Orange Street, and Cedar Avenue and Slover Avenue.

The traffic volume data for the remaining existing intersections were obtained from Newport Traffic Studies, an independent traffic data collection company. Turn movement counts were collected during the AM (7-9 AM) and PM (4-6 PM) peak hour at the above-mentioned existing intersections identified for detailed analysis. These counts were conducted in December 2014, while school was in session. The resulting turning movement volumes are presented in the *Appendix F* of this report.

<div>①CEDAR AVE / VALLEY BLVD</div> <div><div><div>240/165</div><div>880/900</div><div>150/255</div><div></div></div><div><div>85/60</div><div>530/665</div><div>420/470</div><div></div></div></div> <div><div><div>125/330</div><div>320/1025</div><div>560/725</div><div></div></div><div><div>570/745</div><div>860/1235</div><div>190/340</div><div></div></div></div>	<div>②CEDAR AVE / I-10 FREEWAY WB RAMP</div> <div><div><div>660/340</div><div>1155/1690</div><div></div></div><div><div>435/450</div><div>5/5</div><div>295/370</div><div></div></div></div> <div><div></div><div><div>190/240</div><div>1110/1800</div><div></div></div></div>	<div>③CEDAR AVE / I-10 FREEWAY EB RAMP</div> <div><div><div>1290/1385</div><div>1115/895</div><div></div></div><div><div>800/2150</div><div>5/5</div><div>490/385</div><div></div></div></div> <div><div></div><div><div>1340/1350</div><div>465/660</div><div></div></div></div>	<div>④CEDAR AVE / CEDAR PL</div> <div><div><div>5/5</div><div>1065/1300</div><div></div></div><div><div>5/5</div><div>5/5</div><div></div></div></div> <div><div></div><div><div>5/5</div><div>1090/1540</div><div></div></div></div>	<div>⑤CEDAR AVE / ORANGE ST</div> <div><div><div>275/275</div><div>265/685</div><div>60/55</div><div></div></div><div><div>60/85</div><div>5/10</div><div>5/5</div><div></div></div></div> <div><div><div>195/225</div><div>5/5</div><div>25/15</div><div></div></div><div><div>5/20</div><div>915/1925</div><div>15/15</div><div></div></div></div>
<div>⑥CEDAR AVE / SLOVER AVE</div> <div><div><div>135/115</div><div>910/1490</div><div>80/90</div><div></div></div><div><div>85/75</div><div>95/140</div><div>15/15</div><div></div></div></div> <div><div><div>215/345</div><div>100/215</div><div>45/130</div><div></div></div><div><div>85/205</div><div>755/1245</div><div>5/25</div><div></div></div></div>	<div>⑧LINDEN AVE / SLOVER AVE</div> <div><div><div>190/115</div><div>35/55</div><div>10/5</div><div></div></div><div><div>5/20</div><div>215/315</div><div>15/15</div><div></div></div></div> <div><div><div>80/130</div><div>210/360</div><div>15/120</div><div></div></div><div><div>10/25</div><div>40/60</div><div>25/65</div><div></div></div></div>			



LEGEND

XX/XX - AM/PM PEAK HOUR VOLUMES

① - STUDY INTERSECTIONS

Capacity Analysis Methodologies

The San Bernardino County Traffic Impact Study (TIS) Guidelines require that intersection analysis be performed using the latest version of the Transportation Research Board (TRB), Highway Capacity Manual (HCM) methodology. As such the TIS intersection capacity analysis identifies the Level of Service and Delay for each condition consistent with the HCM 2010 methodology.

The intersection capacity analyses were conducted for the signalized and un-signalized intersections using the Synchro Software. Synchro is released by Trafficware Ltd, version 8. Synchro implements the methods of the HCM 2010, chapter 15, 16 and 17.

Signalized Intersections

The analysis determines a LOS which quantitatively describes the operating characteristics of signalized intersections and the maximum delay. *Table 1* provides the HCM 2010 LOS thresholds for signalized intersections.

Table 1: HCM 2010 - LOS Criteria for Signalized Intersections

LOS	Control Delay per Vehicle (s/veh)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Source: HCM 2010

Un-Signalized Intersections

The TWSC intersection analysis LOS is computed for each movement and the most critical LOS is the one that describes the effectiveness of that intersection, which is typically the stop controlled left turn movement from the minor street. The AWSC intersection analysis LOS is defined by the control delay of the whole intersection. *Table 2* provides the HCM 2010 LOS thresholds for TWSC and AWSC intersections.

Table 2: HCM 2010 - LOS Criteria for TWSC and AWSC

LOS	Control Delay per Vehicle (s/veh)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Source: HCM 2010

Current Significant Impact Threshold Guidelines

The Current Significant Impact Threshold is provided in the San Bernardino County Road Planning and Design Standards Section 10 Traffic Studies.

Under the Section 10.12 Recommendations the instruction is “In the event that an analysis indicates unsatisfactory Levels of Service on study area streets, a description of proposed improvements that return intersections to Level of Service “C” shall be included except at locations where the County has already identified a project.

The Section 10.12 Part D Significant Impact identifies the total project peak hour trip threshold by existing LOS value.

Table 3: Intersection Thresholds of Significance for Traffic Impact Studies

Existing LOS	Total Project Peak Hour Trip Generation
A	500
B	250
C	150
D	50
E	30
F	15

Source: San Bernardino County Road Planning and Design Standards

Interim Significant Impact Threshold Guidelines

The Interim Significant Impact Threshold is provided in the San Bernardino County Interim Traffic Impact Study Guidelines Section 10.8 Determination of Impacts.

The interim guideline identifies the acceptable level of service for all study intersections is LOS D.

Any study intersection that is operating at LOS E or LOS F is to be mitigated when project traffic increases the overall level of delay established prior to project traffic being added.

In the event of a conflict between Chapter 10 (Current Significant Impact Threshold Guidelines), as currently adopted, and the proposed guidelines (Interim Significant Impact Threshold Guidelines), the adopted version of Chapter 10 shall take precedence.

2.1 Existing Traffic Analysis

Intersection capacity analysis were conducted for the study intersection to determine an existing intersection level-of-service (LOS), based on the existing intersection geometrics and the AM and PM peak hour traffic volumes. Cedar Avenue signalized intersections operate as a coordinated network and were evaluated as such. The results of the analysis are shown in *Table 4* and provided in *Appendix F*. *Figure 4* illustrates the existing intersection geometrics utilized in the capacity analysis.

Table 4: Intersection Capacity Analysis - Existing Condition
Traffic Study - High-Cube Warehouse/Distribution Center

	Intersection	Jurisdiction	AM		PM	
			Delay (1)	LOS(2)	Delay (1)	LOS(2)
1	Cedar Avenue and Valley Boulevard	Bloomington (County)	57.3	E	130.2	F
2	Cedar Avenue and I-10 Westbound Ramps	Bloomington (Caltrans)	21.2	C	16.9	B
3	Cedar Avenue and I-10 Eastbound Ramps	Bloomington (Caltrans)	220.5	F	343.9	F
4	Cedar Avenue and Cedar Place (3)	Bloomington (County)	30.7	D	64.1	F
5	Cedar Avenue and Orange Street	Bloomington (County)	10.5	B	103.1	F
6	Cedar Avenue and Slover Avenue	Bloomington (County)	116.7	F	403.0	F
8	Linden Avenue and Slover Avenue (3)	Bloomington (County)	12.8	B	22.8	C

(1) Delay –In Seconds

(2) LOS – HCM Level of Service

(3) Un-Signalized Intersection

Source: **David Evans and Associates, Inc.**

As provided in *Table 4* under Existing Condition, five (5) study intersections are operating at LOS “E” or LOS “F”. In the AM peak hour one (1) intersection is operating at LOS “E” and two (2) intersections are operating at LOS “F”. In the PM peak hour five (5) study intersections are operating at LOS “F”.

3 PROJECT OPENING – YEAR 2016

3.1 Year 2016 Ambient Condition

The project is anticipated to open in the Year 2016. To analyze the project impacts, the inclusion of traffic generated by regional ambient growth within the study area is necessary. Typically, ambient growth is expected over the years at rates ranging from 1% to 2% annually, a 1.1% annual increase was utilized. The Year 2016 Ambient Condition addresses impacts due to ambient growth up to the year 2016. *Figure 5* illustrates Year 2016 Ambient Traffic Volumes.

Year 2016 Ambient Traffic Analysis

Intersection capacity analysis for the Year 2016 Ambient Condition was performed using the methodology presented in *Chapter 2* and the existing intersection geometrics. The results of the analysis are shown in *Table 5* and provided in *Appendix F*.

Table 5: Intersection Capacity Analysis - Year 2016 Ambient Condition
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection	Jurisdiction	AM		PM	
		Delay (1)	LOS(2)	Delay (1)	LOS(2)
1 Cedar Avenue and Valley Boulevard	Bloomington (County)	60.6	E	137.4	F
2 Cedar Avenue and I-10 Westbound Ramps	Bloomington (Caltrans)	24.8	C	18.6	B
3 Cedar Avenue and I-10 Eastbound Ramps	Bloomington (Caltrans)	232.9	F	358.9	F
4 Cedar Avenue and Cedar Place (3)	Bloomington (County)	35.8	E	100.3	F
5 Cedar Avenue and Orange Street	Bloomington (County)	10.8	B	113.2	F
6 Cedar Avenue and Slover Avenue	Bloomington (County)	124.7	F	420.7	F
8 Linden Avenue and Slover Avenue (3)	Bloomington (County)	13.8	B	28.2	D

(1) Delay – In Seconds

(2) LOS – HCM Level of Service

(3) Un-Signalized Intersection

Source: **David Evans and Associates, Inc.**

As provided in *Table 5* under Year 2016 Ambient Condition, five (5) study intersections are anticipated to operate at LOS “E” or LOS “F”.

The County, in cooperation with the California Department of Transportation District 8 (Caltrans), proposes improvements at the I-10 Freeway and Cedar Avenue Interchange, which includes the widening Cedar Avenue bridge, and improvements at the Westbound and Eastbound ramp intersections. The project is currently in the design phase with construction anticipated to begin in 2018 and completed in 2020 as provided by Mary Brown the SANBAG delivery group lead. The Interchange Project Improvement Plans are provided in *Appendix C*.

The Current Traffic Study Guideline states; in the event that an analysis indicates unsatisfactory Levels of Service on study area streets, a description of proposed improvements that return intersections to Level of Service “C” shall be included, except at locations where the County has already identified a project. The significant impacts are outlined in *Chapter 5*.

3.2 Year 2016 Ambient and Proposed Project Condition

Project Trip Generation

The project was analyzed to determine the amount of traffic that would be generated from the proposed development. To identify potential traffic impacts, trip generation factors were applied to the land use to generate project trip estimates. The trip generation factors for High-Cube Warehouse/Distribution Center were obtained from the 9th Edition of the Institute of Transportation Engineers trip generation report. The anticipated truck mix is 80% passenger vehicles and 20% trucks as outlined in the Fontana Truck Trip Generation Study. The Passenger Car Equivalent (PCE) Trips are calculated with a PCE factor of 3.0.

Table 6: Project Trip Generation
Traffic Study - High-Cube Warehouse/Distribution Center

	Use	Daily	A.M. Peak Hour			P.M. Peak Hour		
			In	Out	Total	In	Out	Total
1	High-Cube Warehouse/Distribution Center							
	(ITE 152) 1,000 Sq Ft Gross Floor Area	1.68	0.08	0.03	0.11	0.04	0.08	0.12
	371,422 Sq Ft Gross Floor Area	624	28	13	41	14	31	45
	Auto Trips (80%)	499	23	10	33	11	25	36
	Truck Trips (20%)	125	6	3	8	3	6	9
	Total Trips	624	28	13	41	14	31	45
	Truck PCE Trips	374	17	8	25	8	18	27
	Total PCE Trips	874	39	18	57	19	43	62

Source: "Trip Generation Manual, Institute of Transportation Engineers", 9th Edition

As presented in *Table 6*, it is estimated that the project will generate 874 Daily PCE Trips, 57 PCE Trips during the AM peak hour trips and 62 PCE Trips during the PM peak hour.

Project Trip Distribution

To address the impacts of the estimated project traffic, the trips were distributed and assigned to the surrounding streets and study intersections. The project traffic was distributed based on the anticipated project utilization. Once the distribution pattern was established, project trips were assigned to the area streets that serve the project.

Figure 6 illustrates the general and specific estimated distribution pattern for the Auto Trip Distribution. *Figure 7* illustrates the general and specific estimated distribution pattern for the Truck Project Trips. *Figure 8* illustrates the estimated Auto Project Trip Distribution. *Figure 9* illustrates the estimated Truck PCE Project Trip Distribution. *Figure 10* illustrates the estimated Total PCE Project Trip Distribution.

Year 2016 Ambient and Proposed Project Traffic Analysis

Based on the proposed project trip generation, traffic distribution and assignment patterns intersection capacity analyses were conducted to assess the estimated project impacts. The project trips were added to the Year 2016 Ambient Traffic Volumes to develop the Year 2016 Ambient and Proposed Project Traffic Volumes, illustrated in *Figure 11*.

Intersection capacity analysis for the Year 2016 Ambient and Proposed Project Condition was performed using the methodology presented in *Chapter 2* and the existing intersection geometrics. The results of the analysis are shown in *Table 7* and provided in *Appendix F*.

Table 7: Intersection Capacity Analysis - Year 2016 Ambient + Proposed Project Condition
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection	Jurisdiction	AM		PM	
		Delay (1)	LOS(2)	Delay (1)	LOS(2)
1 Cedar Avenue and Valley Boulevard Mitigations: Project Specific Improvements	Bloomington (County)	63.2 52.6	E D	140.5 121.5	F F
2 Cedar Avenue and I-10 Westbound Ramps	Bloomington (Caltrans)	26.9	C	19.6	B
3 Cedar Avenue and I-10 Eastbound Ramps	Bloomington (Caltrans)	235.2	F	362.3	F
4 Cedar Avenue and Cedar Place (3) Mitigations: Project Specific Improvements	Bloomington (County)	59.6 13.3	F B	204.8 15.1	F C
5 Cedar Avenue and Orange Street Mitigations: Project Specific Improvements	Bloomington (County)	11.3 25.7	B C	113.4 112.5	F F
6 Cedar Avenue and Slover Avenue Mitigations: County Project Slover Avenue –Phase II	Bloomington (County)	127.6 48.7	F D	423.5 274.4	F F
7 Project Driveway and Orange Street (3) Mitigations: Project Specific (TWLTL)	Bloomington (County)	12.4 11.3	B B	13.0 11.6	B B
8 Linden Avenue and Slover Avenue (3)	Bloomington (County)	14.3	B	30.9	D

(1) Delay –In Seconds

(2) LOS – HCM Level of Service

(3) Un-Signalized Intersection

Source: David Evans and Associates, Inc.

As presented in *Table 7* under Year 2016 Ambient and Proposed Project Condition, five (5) study intersections are anticipated to continue to operate at LOS “E” or LOS “F”. The intersections of Cedar Avenue and Valley Boulevard and Cedar Avenue and Slover Avenue are among the intersections anticipated to continue to operate at LOS “E” or LOS “F”. The addition of project traffic results in the intersections incurring additional delay.

The project specific impacts are identified based on the San Bernardino County Road Planning and Design Standards (Current Traffic Study Guideline) and the County of San Bernardino Interim Traffic Impact Study Guidelines (Interim Traffic Impact Study Guideline). The Current Traffic Study Guideline identifies that in the event that an analysis indicates unsatisfactory Levels of Service on study area streets, a description of proposed improvements that return intersections to Level of Service “C” shall be included, except at locations where the County has already identified a project. The Interim Traffic Impact Study Guideline identifies that any study intersection that is operating at a LOS ‘E’ or ‘F’ for any scenario without project traffic shall mitigate any impacts so as to bring the intersection back to the overall level of delay established prior to project traffic being added.

Therefore, the project specific improvements include improvements to the intersections of Cedar Avenue and Valley Boulevard and Cedar Avenue and Slover Avenue to bring the intersection back to the overall level of delay established prior to project traffic being added. The significant impacts are outlined in *Chapter 5*.

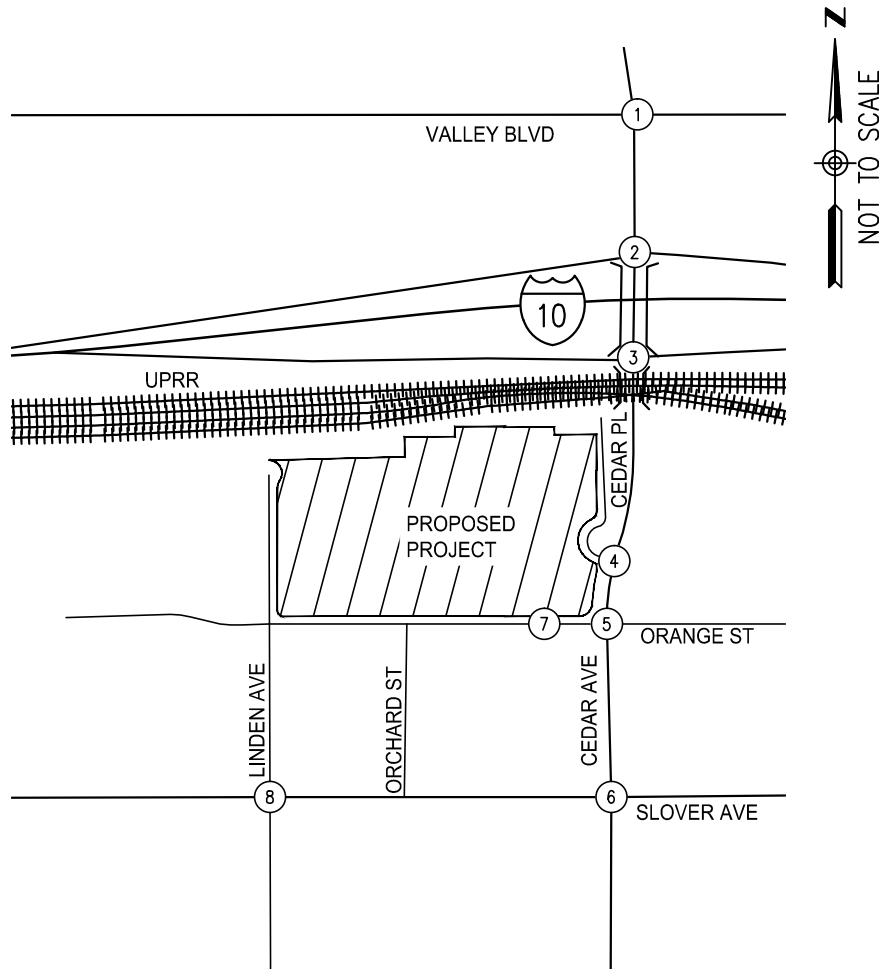
Proposed project specific improvements include; a two way left turn lane (TWLTL) along Orange Street, Orange Street at Cedar Avenue is to be restriped to provide east and westbound left turn lanes and east-west split signal phasing modifications, and Cedar Place will be converted to a right in/right out only access road.

Improvements to the intersection of Cedar Avenue and Valley Boulevard include converting an eastbound right to an eastbound shared through – right. Additionally, the improvements include adjusting the am peak period signal timing so that the eastbound left, westbound left, and southbound left are lagging phases.

Improvements to the intersection of Cedar Avenue and Slover Avenue include widening the eastbound direction to accommodate an eastbound through lane. Convert the westbound right turn lane to a westbound shared through – right. Additionally optimize the signal timing for both the am and pm peak period to accommodate the additional capacity. ***The improvements identified at the intersection of Cedar Avenue and Slover Avenue is referenced from the Slover Avenue – Phase II Project provided by the county.***

The improvements are outlined in *Chapter 5* and illustrated on *Figure 12*.

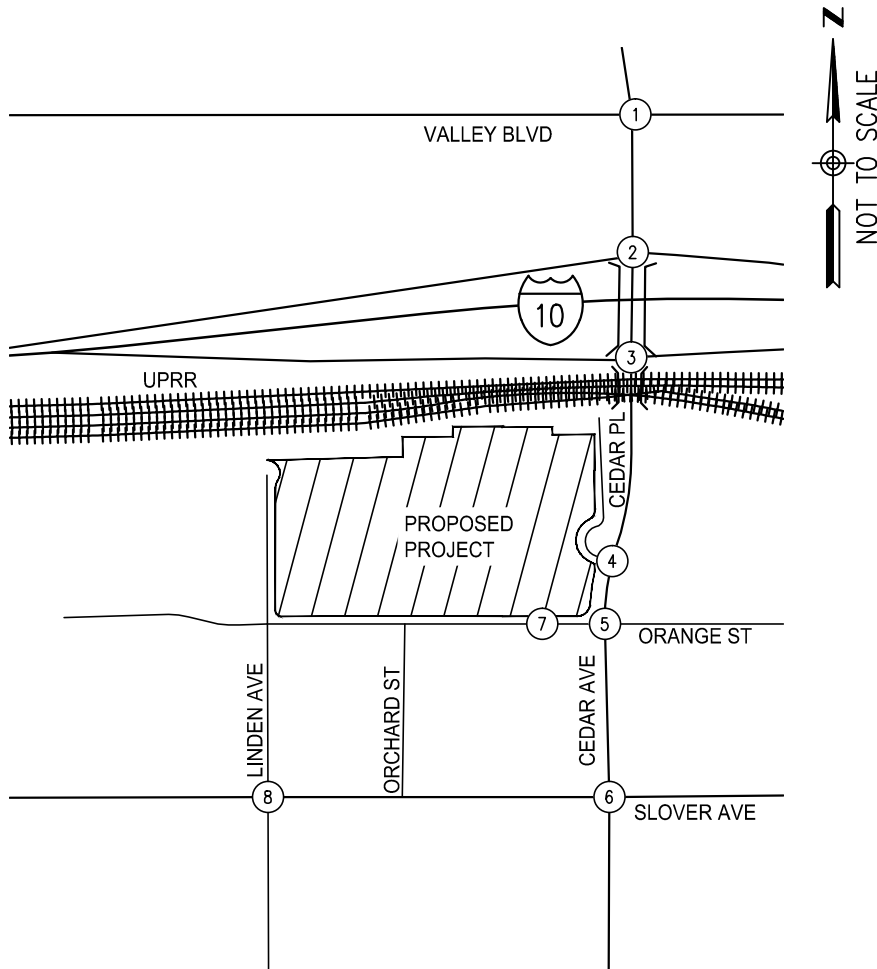
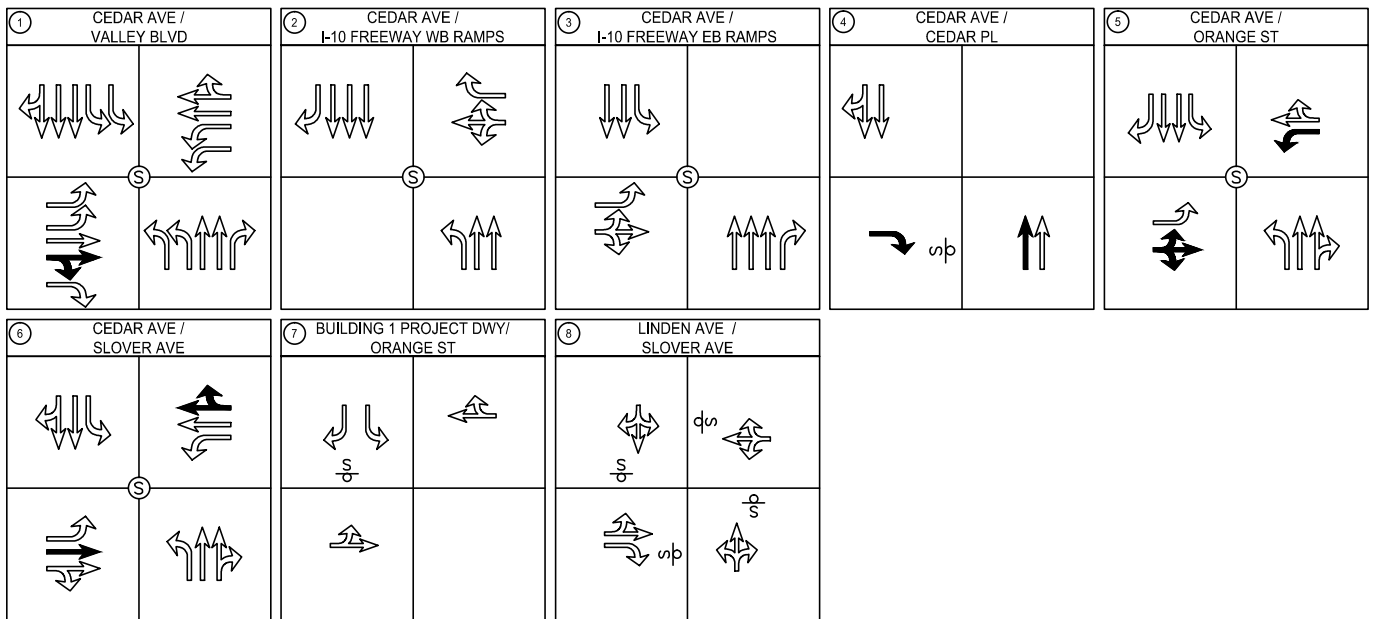
<p>1 CEDAR AVE / VALLEY BLVD</p> <p>245/170 910/930 155/260</p> <p>90/65 540/680 440/490</p> <p>130/335 325/1050 580/750</p> <p>595/770 890/1270 205/355</p>	<p>2 CEDAR AVE / I-10 FREEWAY WB RAMP</p> <p>675/345 1190/1735</p> <p>445/460 10/10 310/390</p> <p>205/255 1145/1850</p>	<p>3 CEDAR AVE / I-10 FREEWAY EB RAMP</p> <p>1340/1405 1140/915</p> <p>820/2195 10/10 510/405</p> <p>1380/1400 485/685</p>	<p>4 CEDAR AVE / CEDAR PL</p> <p>25/20 1105/1340</p> <p>30/30</p> <p>1140/1620</p>	<p>5 CEDAR AVE / ORANGE ST</p> <p>295/290 280/610 65/60</p> <p>65/90 10/15 10/10</p> <p>215/265 10/10 40/30</p> <p>20/35 935/1965 20/20</p>
<p>6 CEDAR AVE / SLOVER AVE</p> <p>140/120 940/1535 95/105</p> <p>100/90 100/145 20/20</p> <p>220/355 105/220 50/135</p> <p>90/210 780/1280 10/30</p>	<p>7 BUILDING 1 PROJECT DWY / ORANGE ST</p> <p>10/15</p> <p>15/10 300/320</p> <p>240/270</p>	<p>8 LINDEN AVE / SLOVER AVE</p> <p>205/130 40/60 15/10</p> <p>10/25 220/320 20/20</p> <p>95/145 215/370 20/125</p> <p>15/30 45/65 30/70</p>		



LEGEND

XX/XX - AM/PM PEAK HOUR VOLUMES

① - STUDY INTERSECTIONS



LEGEND

- $\frac{p}{s}$ - UNSIGNALIZED INTERSECTION
- *
 - FREE RIGHT TURN
- Ⓢ - SIGNALIZED INTERSECTION
- ① - STUDY INTERSECTIONS
- EXISTING GEOMETRICS
- PROPOSED GEOMETRICS

3.3 Year 2016 Cumulative Condition

The Year 2016 Cumulative Condition combines Other Area Projects trips (as provided by San Bernardino County Planning, the City of Fontana, and the City of Rialto), Project Traffic, and ambient growth up to the Opening year 2016 within the study area. The Other Area Project Information is provided in *Appendix E*.

Other Area Projects

To analyze the cumulative impacts, the inclusion of traffic generated by other projects within the study area is necessary. The Other Area projects include approved projects that were recently constructed or will be constructed by Project Opening Year 2016.

The approved recently constructed or to be constructed Other Area projects are provided in *Table 8*.

Table 8: Other Area Project Trip Generation
Traffic Study - High-Cube Warehouse/Distribution Center

	Use	Daily	A.M. Peak Hour			P.M. Peak Hour		
			In	Out	Total	In	Out	Total
1	(APN:0256-041-01,02,03) – Warehouse (1)	758	35	15	50	16	38	54
2	(APN: 0252-173-67, 66) - Warehouse (1)	629	50	24	74	6	38	44
3	(APN: 0252-051-70,69) – Housing (1)	1,432	22	64	86	82	59	141
4	(APN: 0256-091-07) - Housing (1)*	239	5	14	19	16	9	25
5	West Valley Logistics Center (2)	8,365	380	195	575	223	398	621
6	Oakmont Olive Grove Business Park (3)	15,865	1,183	256	1,440	384	1,120	1,504

Source: (1) - County of San Bernardino
(2) - City of Fontana
(3) - City of Rialto

The project list was provided by San Bernardino County Planning, the City of Fontana, and the City of Rialto. The list includes other area projects that do not provide trips to the proposed study intersections; these other area projects are noted with an asterisk (*). The other area project trips are illustrated in *Figure 13*.

Year 2016 Cumulative Traffic Analysis

To determine the cumulative impacts at the study intersection the other area project trips were added to the Year 2016 Ambient and Proposed Project Traffic Volumes to produce the Year 2016 Cumulative Traffic Volumes, illustrated in *Figure 14*.

Intersection capacity analysis for the Year 2016 Cumulative Condition was performed using the methodology presented in *Chapter 2* and the existing intersection geometrics and project specific proposed improvements. The results of the analysis are shown in *Table 9* and provided in *Appendix F*.

Table 9: Intersection Capacity Analysis - Year 2016 Cumulative Condition
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection	Jurisdiction	AM		PM	
		Delay (1)	LOS(2)	Delay (1)	LOS(2)
1 Cedar Avenue and Valley Boulevard Mitigations: Project Specific Improvements	Bloomington (County)	68.7 63.1	E D	152.1 132.9	F F
2 Cedar Avenue and I-10 Westbound Ramps	Bloomington (Caltrans)	45.4	D	62.9	E
3 Cedar Avenue and I-10 Eastbound Ramps	Bloomington (Caltrans)	262.5	F	399.9	F
4 Cedar Avenue and Cedar Place (3) Mitigations: Project Specific Improvements	Bloomington (County)	127.3 16.2	F C	270.0 16.4	F C
5 Cedar Avenue and Orange Street Mitigations: Project Specific Improvements	Bloomington (County)	12.0 27.4	B C	178.6 176.3	F F
6 Cedar Avenue and Slover Avenue Mitigations: County Improvement Project	Bloomington (County)	205.1 95.5	F F	509.6 334.7	F F
7 Project Driveway and Orange Street (3) Mitigations: Project Specific (TWLTL)	Bloomington (County)	12.4 11.3	B B	13.0 11.6	B B
8 Linden Avenue and Slover Avenue (3) Mitigations: Regional Improvements	Bloomington (County)	18.2 16.2	C B	36.7 14.4	E B

(1) Delay –In Seconds

(2) LOS – HCM Level of Service

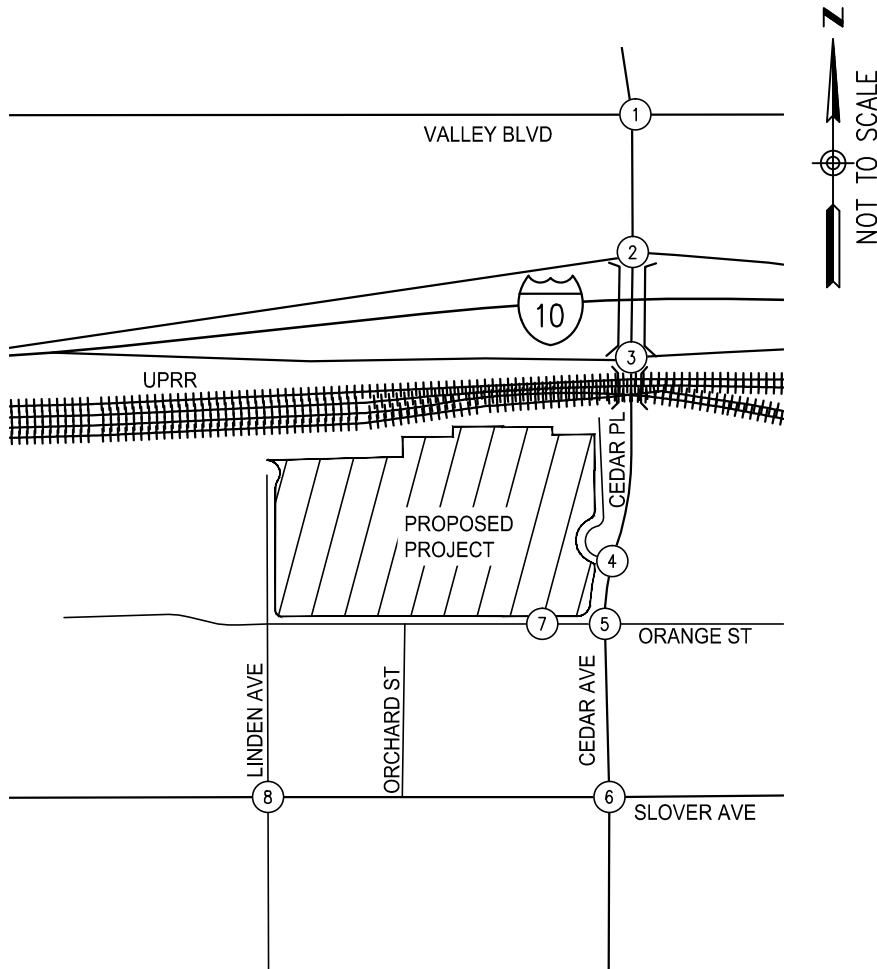
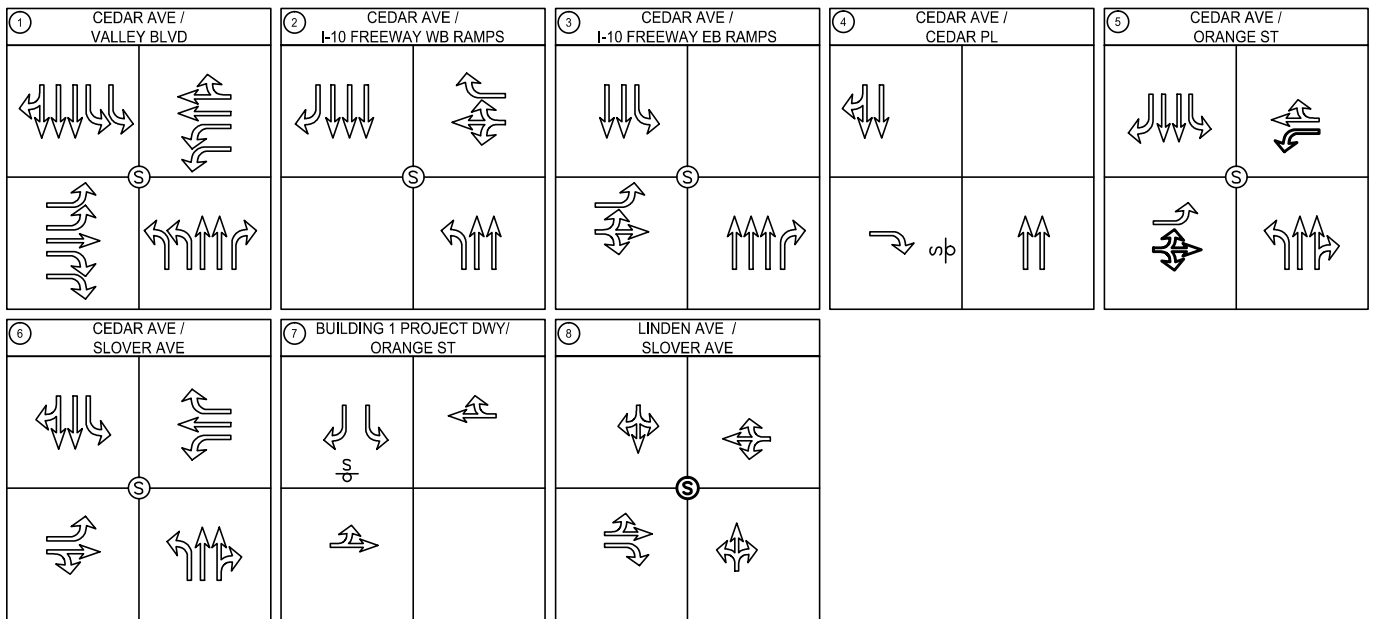
(3) Un-Signalized Intersection

Source: **David Evans and Associates, Inc.**

As presented in *Table 9* under Year 2016 Cumulative Condition, seven (7) study intersections are anticipated to operate at LOS “E” or LOS “F”. Of the identified study intersections six (6) are anticipated to operate at LOS “E” or LOS “F” until the I-10 Freeway Interchange at Cedar Avenue project is completed. The Current Traffic Study Guideline states in the event that an analysis indicates unsatisfactory Levels of Service on study area streets, a description of proposed improvements that return intersections to Level of Service “C” shall be included except at locations where the County has already identified a project. Therefore, the six (6) study intersections that are anticipated to continue to operate at LOS “E” and “F” are not impacted under this traffic scenario, and no mitigation is required. The significant impacts are outlined in *Chapter 5*.

Proposed project specific improvements include; a two way left turn lane (TWLTL) along Orange Street, Orange Street at Cedar Avenue is to be restriped to provide east and westbound left turn lanes and east-west split signal phasing modifications, and Cedar Place will be converted to a right in right out only access road.

Additional regional improvements identified in *Table 9* include signaling the intersection of Linden Ave and Slover Ave. The improvements are outlined in *Chapter 5* and illustrated on *Figure 15*.



LEGEND

- $\frac{P}{S}$ - UNSIGNALIZED INTERSECTION
- *
 - FREE RIGHT TURN
- (S) - SIGNALIZED INTERSECTION
- (I) - STUDY INTERSECTIONS
- EXISTING GEOMETRICS
- PROJECT SPECIFIC PROPOSED GEOMETRICS

4 BUILDOUT – YEAR 2035

The County of San Bernardino provided volumes from the San Bernardino Transportation Analysis Model (SBTAM) Traffic Model. The Model Plots are provided in *Appendix B*. The Future Year 2035 intersection turn movements were determined using existing counts and the model plot approach volumes. These values were then used in a 'Future Directional Link Volume (NCHRP 255)' calculator to determine Future Year 2035 Turn Movement Volumes.

4.1 Year 2035 Ambient Condition

The analysis of ambient traffic allows a comparison of traffic impacts with and without the project. *Figure 16* illustrates Year 2035 Ambient Traffic Volumes.

Year 2035 Ambient Traffic Analysis

Intersection capacity analysis for the Year 2035 Ambient Condition was performed using the methodology presented in *Chapter 2* with the I-10 and Cedar Avenue Interchange Improvements and the previously identified Year 2016 Regional Mitigations. Cedar Avenue signalized intersections operate as a coordinated network and were evaluated as such. The results of the analysis are shown in *Table 10* and provided in *Appendix F*.

Table 10: Intersection Capacity Analysis - Year 2035 Ambient Condition
Traffic Study - High-Cube Warehouse/Distribution Center

	Intersection	Jurisdiction	AM		PM	
			Delay (1)	LOS(2)	Delay (1)	LOS(2)
1	Cedar Avenue and Valley Boulevard Mitigations: Interchange Project Improvements	Bloomington (County)	238.4 39.5	F D	313.4 58.1	F E
2	Cedar Avenue and I-10 Westbound Ramps Mitigations: Interchange Project Improvements	Bloomington (Caltrans)	81.1 24.0	F C	137.1 24.8	F C
3	Cedar Avenue and I-10 Eastbound Ramps Mitigations: Interchange Project Improvements	Bloomington (Caltrans)	135.4 22.8	F C	113.3 27.2	F C
4	Cedar Avenue and Cedar Place (3) Mitigations: Interchange Project Improvements	Bloomington (County)	954.3 30.4	F D	196.0 18.4	F C
5	Cedar Avenue and Orange Street Mitigations: Interchange Project Improvements	Bloomington (County)	111.3 19.3	F B	111.9 14.7	F B
6	Cedar Avenue and Slover Avenue Mitigations: Interchange Project Improvements	Bloomington (County)	464.6 55.4	F E	537.6 78.5	F E
8	Linden Avenue and Slover Avenue Mitigations: Regional Improvements	Bloomington (County)	54.1 15.7	F B	54.0 10.2	F B

(1) Delay – In Seconds

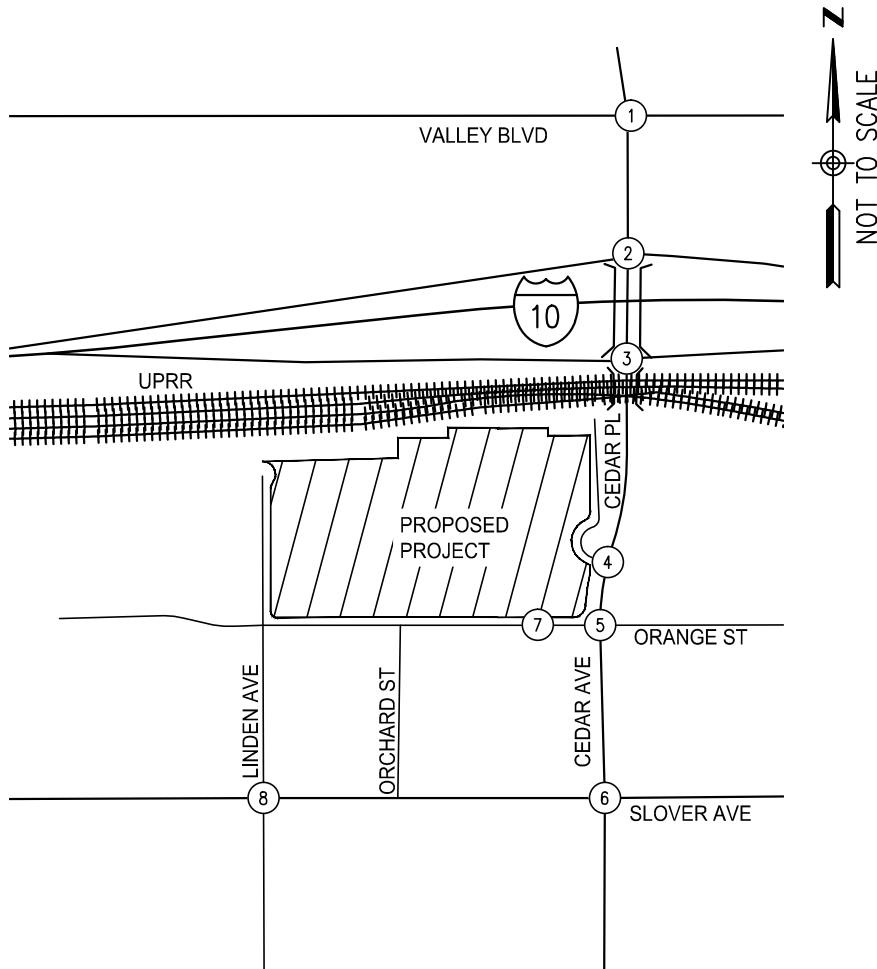
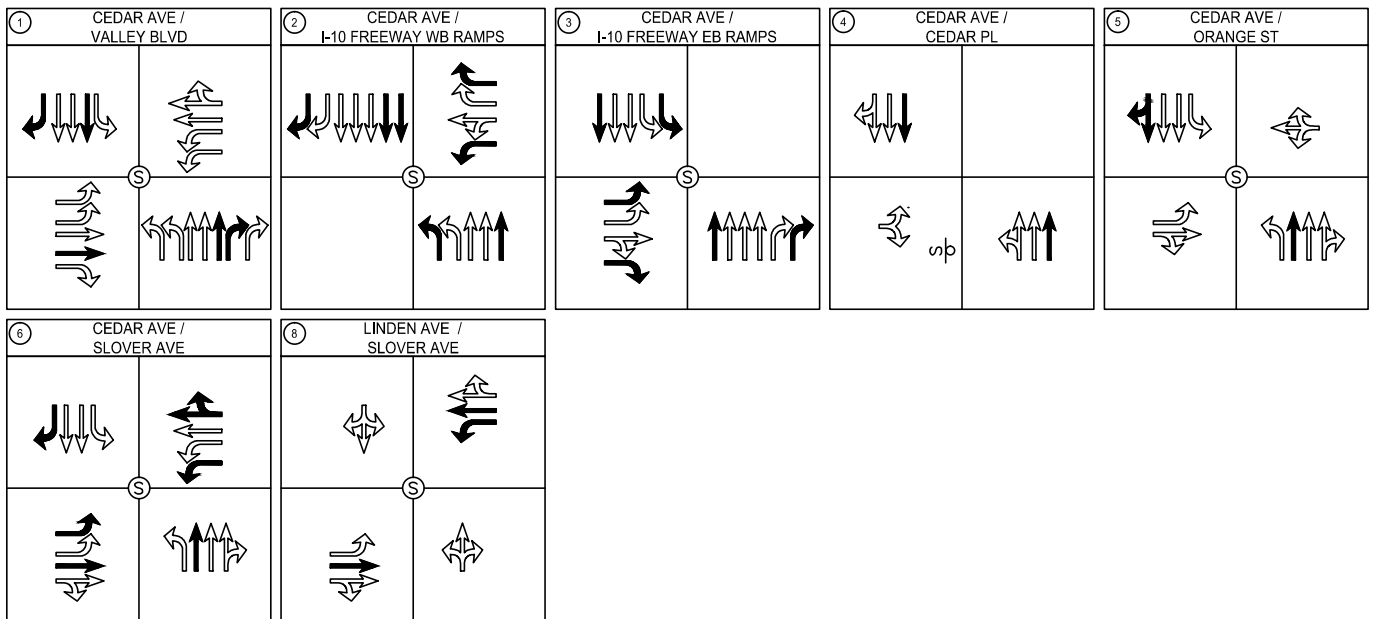
(2) LOS – HCM Level of Service

(3) Un-Signalized Intersection

Source: David Evans and Associates, Inc.

As provided in *Table 10* under Year 2035 Ambient Condition, the study intersections are anticipated to operate at LOS “E”, or better, with the I-10 and Cedar Avenue Interchange Improvements. Therefore, no project impacts would occur under this traffic scenario and no additional mitigation is required. The significant impacts are outlined in *Chapter 5*.

The improvements are outlined in *Chapter 5* and illustrated on *Figure 17*.



LEGEND

- UNSIGNALIZED INTERSECTION
- FREE RIGHT TURN
- SIGNALIZED INTERSECTION
- STUDY INTERSECTIONS
- EXISTING GEOMETRICS
- PROPOSED GEOMETRICS

4.2 Year 2035 Ambient Proposed Project Condition

The Year 2035 Ambient Condition addresses impacts due to ambient growth up to the buildout year 2035 within the study area. The analysis of ambient traffic allows a comparison of traffic impacts with and without the project. To determine the project impacts at the study intersection and driveways, project trips were added to the Year 2035 Ambient Traffic Volumes to produce the Year 2035 Ambient and Proposed Project Traffic Volumes, illustrated in *Figure 18*.

Year 2035 Ambient Proposed Project Traffic Analysis

Intersection capacity analysis for the Project Condition was performed using the methodology presented in *Chapter 2* with the I-10 and Cedar Avenue Interchange Improvements, the previously identified Year 2016 Regional Mitigations and Project Specific Mitigations. Cedar Avenue signalized intersections operate as a coordinated network and were evaluated as such. The results of the analysis are shown in *Table 11* and provided in *Appendix F*.

Table 11: Intersection Capacity Analysis - Year 2035 Ambient + Proposed Project Condition
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection	Jurisdiction	AM		PM	
		Delay (1)	LOS(2)	Delay (1)	LOS(2)
1 Cedar Avenue and Valley Boulevard	Bloomington (County)	52.9	D	63.3	E
2 Cedar Avenue and I-10 Westbound Ramps	Bloomington (Caltrans)	14.3	B	24.8	C
3 Cedar Avenue and I-10 Eastbound Ramps	Bloomington (Caltrans)	27.3	C	2.93	C
4 Cedar Avenue and Cedar Place (3)	Bloomington (County)	43.1	E	20.9	C
5 Cedar Avenue and Orange Street	Bloomington (County)	46.7	D	26.0	C
6 Cedar Avenue and Slover Avenue	Bloomington (County)	51.1	D	72.9	D
7 Project Driveway and Orange Street (3)	Bloomington (County)	9.5	A	9.6	A
8 Linden Avenue and Slover Avenue	Bloomington (County)	15.7	B	10.8	B

(1) Delay – In Seconds

(2) LOS – HCM Level of Service

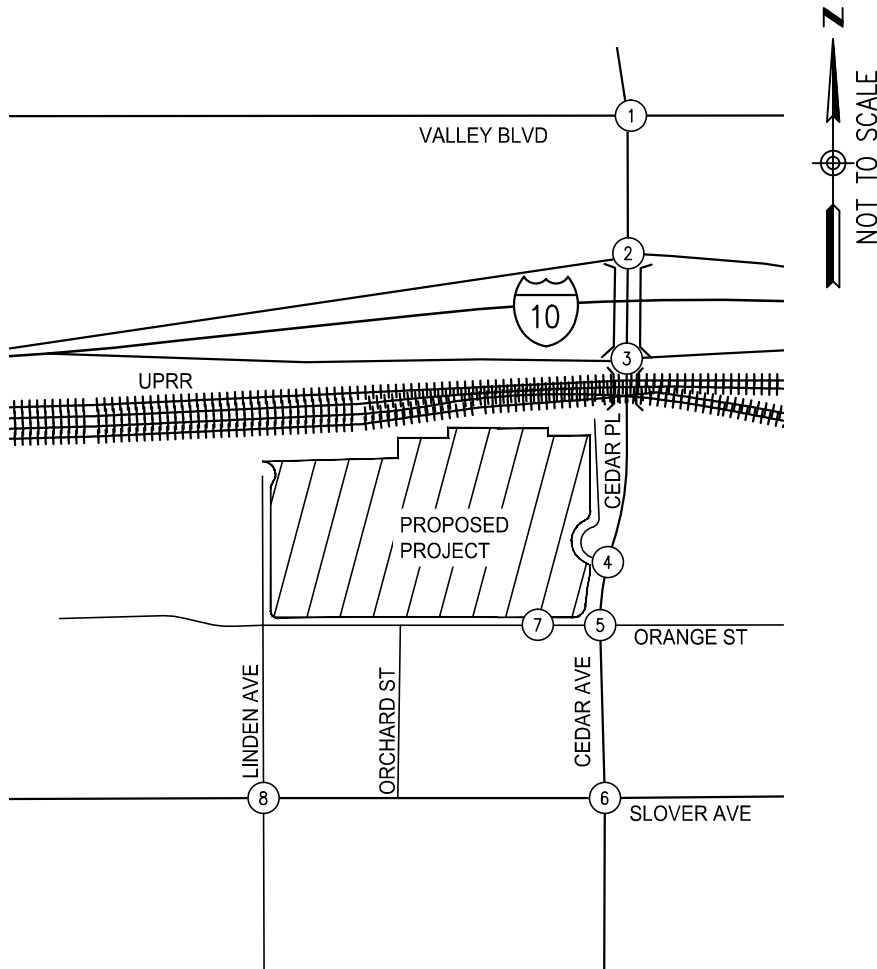
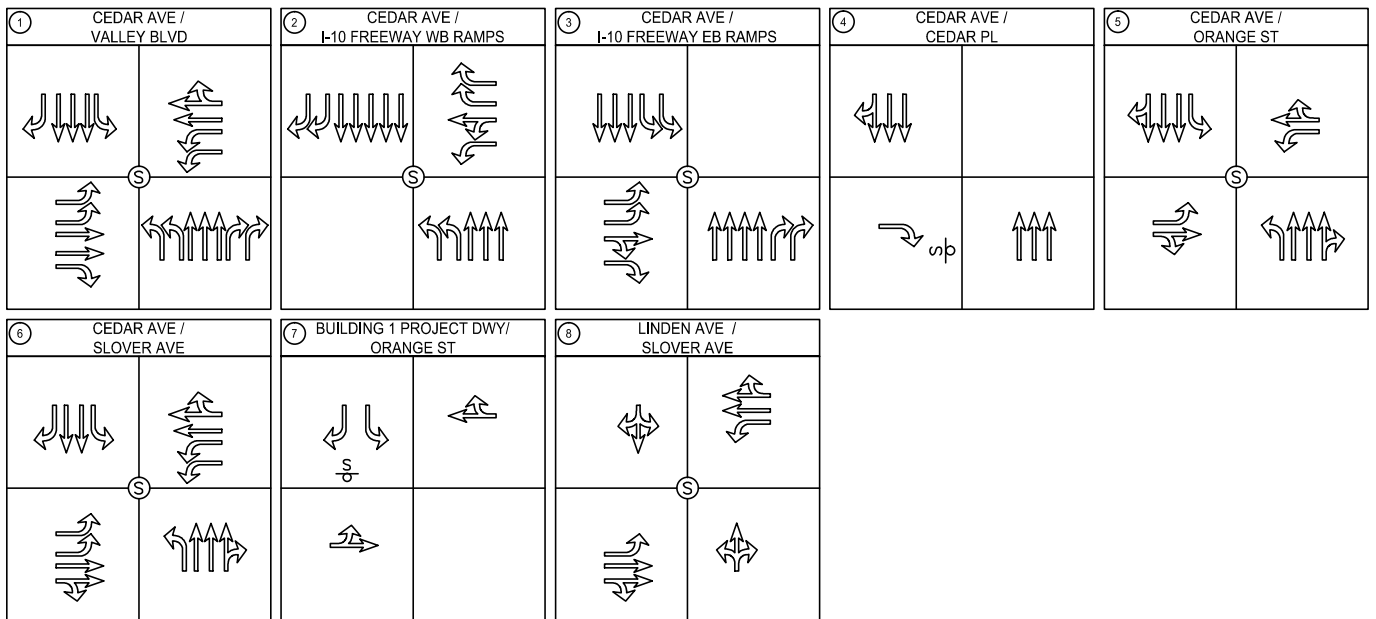
(3) Un-Signalized Intersection

Source: **David Evans and Associates, Inc.**

As presented in *Table 11* under Year 2035 Ambient and Proposed Project Condition, the study intersections are anticipated to operate at LOS “E”, or better, with the I-10 and Cedar Avenue Interchange Improvements. The project specific impacts are identified based on the San Bernardino County Road Planning and Design Standards (Current Traffic Study Guideline) and the County of San Bernardino Interim Traffic Impact Study Guidelines (Interim Traffic Impact Study Guideline). The intersection geometrics utilized in the capacity analysis are illustrated on *Figure 19*.

The Current Traffic Study Guideline identifies that in the event that an analysis indicates unsatisfactory Levels of Service on study area streets, a description of proposed improvements that return intersections to Level of Service “C” shall be included except at locations where the County has already identified a project. The Interim Traffic Impact Study Guideline identifies that any study intersection that is operating at a LOS ‘E’ or ‘F’ for any scenario without project traffic shall mitigate any impacts so as to bring the intersection back to the overall level of delay established prior to project traffic being added.

As presented, no project impacts would occur under this traffic scenario and no additional mitigation is required. The significant impacts are outlined in *Chapter 5*.



LEGEND

- UNSIGNALIZED INTERSECTION
- FREE RIGHT TURN
- SIGNALIZED INTERSECTION
- STUDY INTERSECTIONS
- EXISTING GEOMETRICS

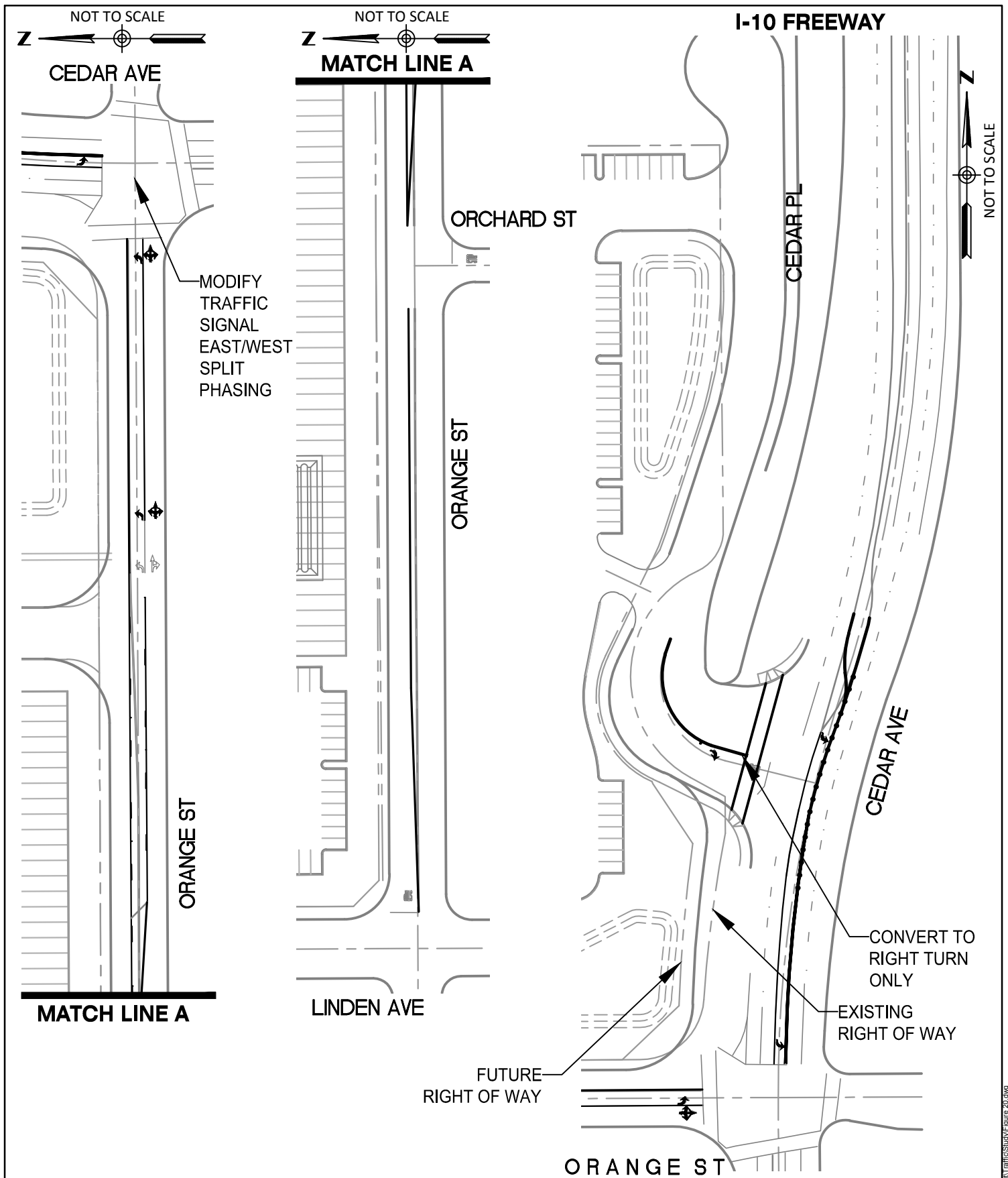
5 PROJECT MITIGATION AND SUMMARY

In summary, the project as presented will not cause significant impacts to the intersections. The Project Specific Mitigations are illustrated in *Figure 20*. The Truck Turning Templates are illustrated in *Figure 21*.

5.1 Year 2016 Project Mitigations

To accommodate project traffic, specific traffic mitigations have been identified. The project specific mitigation consists of the recommended improvements for Orange Street along the project frontage. The project recommended mitigations include;

1. Construct driveway approaches along Orange Street, Linden Avenue and Cedar Place.
2. Restripe to provide a two way left turn lane (TWLTL) along Orange Street a distance of approximately 220 ft west of Cedar Avenue.
3. Cedar Avenue and Valley Boulevard: Intersection improvements include converting an eastbound right to an eastbound shared through – right. Additionally adjust the am peak period signal timing so that the eastbound left, westbound left, and southbound left are lagging phases. The eastbound right will be restriped to an eastbound shared through – right turn lane. The eastbound approach will provide two left turn lanes, a through lane, a shared through-right and a right turn lane. The westbound approach will provide two left turn lanes, a through lane, and a shared through-right. The northbound direction approach will provide two left turn lanes, two through lanes, and a right turn lane. The southbound approach will provide two left turn lanes, two through lanes, and a shared through-right.
4. Cedar Avenue (north-south) and Cedar Place (east-west); Intersection improvements include restricting Cedar Place to right turn in and out access. Cedar Place eastbound direction will provide a single right turn lane. Cedar Avenue northbound shared left-through lane is converted to a through lane. The northbound direction will provide two through lanes. Cedar Avenue southbound direction will provide a through and a shared through-right lane.
5. Cedar Avenue and Orange Street; Intersection improvements include restriping along Orange Street to accommodate additional lanes and signal timing modifications. The shared through-right eastbound lane will be converted to a shared left-through-right turn lane. The eastbound approach will provide a left turn lane and a shared left-through-right turn lane. The westbound direction will be restriped to include a left turn lane. The westbound approach will provide a left turn lane and a shared through-right turn lane. The northbound direction approach will provide a left turn lane, a through, and a shared through-right lane. The southbound approach will provide a left turn lane, two through lanes, and a right turn lane. Signal timing modifications will include east-west split phasing to accommodate the eastbound left lane and shared westbound left-through-right lane.
6. Project Driveway and Orange Street; Provide a full access driveway. The eastbound direction will provide a shared left-through lane. The westbound direction will provide a shared through-right lane. The southbound direction will provide a shared left-right turn lane. The driveway is to be installed 250' west of Cedar Avenue.



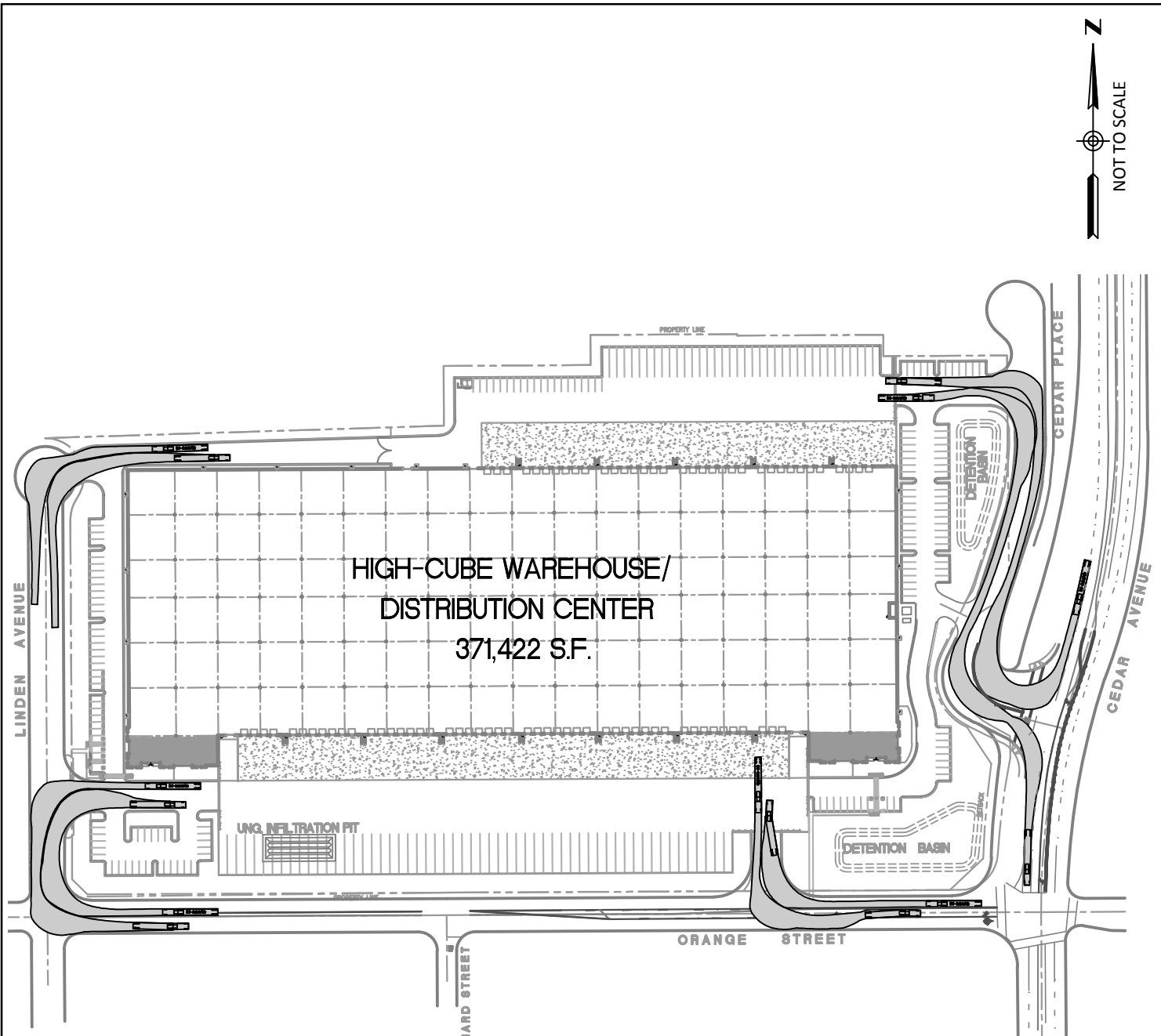
**DAVID EVANS
AND ASSOCIATES INC.**

CONCEPTUAL GEOMETRIC PLANS

HIGH-CUBE WAREHOUSE/DISTRIBUTION CENTER
BLOOMINGTON, CALIFORNIA

FIGURE

20



Significant Impact Analysis

The following is an outline of the Significant Impact Analysis for the Study intersections. The significant impact analysis reviewed the Current Significant Impact Threshold Guidelines and the Interim Significant Impact Threshold Guidelines as provided in *Chapter 2*. The Significant Impacts are provided in *Table 12* for the AM Peak Hour and *Table 13* for the PM Peak Hour.

Table 12: Significant Impact AM Peak Hour Comparison Table
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection		Jurisdiction	Existing Condition		Year 2016 Ambient + Project Condition		Total Project Peak Hour Trips	Difference with vs. without project Significant Impact		DIF Project
			Delay	LOS	Delay	LOS		Project Trips (1)	LOS (2)	
1	Cedar Avenue and Valley Boulevard	Bloomington (County)	57.3	E	63.2	E	60	YES	YES	NO
2	Cedar Avenue and I-10 Westbound Ramps	Bloomington (Caltrans)	21.2	C	26.9	C	40	NO	NO	YES
3	Cedar Avenue and I-10 Eastbound Ramps	Bloomington (Caltrans)	220.5	F	235.2	F	45	YES	YES	YES
4	Cedar Avenue and Cedar Place	Bloomington (County)	30.7	D	59.6	F	55	YES	YES	NO
5	Cedar Avenue and Orange Street	Bloomington (County)	10.5	B	11.3	B	60	NO	NO	NO
6	Cedar Avenue and Slover Avenue	Bloomington (County)	116.7	F	127.6	F	40	YES	YES	NO
7	Project Driveway and Orange Street	Bloomington (County)	N/A	N/A	12.4	B	45	N/A	N/A	NO
8	Linden Avenue and Slover Avenue	Bloomington (County)	12.8	B	14.3	B	20	NO	NO	NO

1. San Bernardino County Road Planning and Design Standards Section 10 Traffic Studies, dated April 20, 1993
2. San Bernardino County Interim Traffic Impact Study Guidelines Section 10.8 Determination of Impacts, dated April 9, 2014.

As shown in *Table 12* four (4) intersections are considered to be significantly impacted by the proposed project when utilizing the Current Significant Impact Threshold Guidelines. The intersections are considered to be impacted due to the number of trips added to the intersection based on the existing Level of Service as outlined in the *Table 3: Intersection Thresholds of Significance for Traffic Impact Studies* provided in *Chapter 2*. When utilizing the Interim Significant Impact Threshold Guidelines three (3) intersections are considered to be significantly impacted by the proposed project.

Although the intersection of Cedar Avenue and I-10 Westbound Ramps is considered to be impacted by the proposed project, the Current Significant Impact Threshold Guidelines identifies that in the event that an analysis indicates unsatisfactory Levels of Service on study area intersections a description of proposed improvements that return intersections to Level of Service "C" shall be included, except at locations where the County has already identified a project. As a result of this intersection being included in the SANBAG Rialto Sphere Nexus Study Development Impact Fee (DIF) program, the intersection is considered not to be significantly impacted by the proposed project.

Project specific improvements to the intersections of Cedar Avenue and Valley Boulevard and Cedar Avenue and Slover Avenue to bring the intersection back to the overall level of delay established prior to project traffic being added are outlined in *Chapter 3.2* and *Chapter 5.1*.

Table 13: Significant Impact PM Peak Hour Comparison Table
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection		Jurisdiction	Existing Condition		Year 2016 Ambient + Project Condition		Total Project Peak Hour Trips	Difference with vs. without project Significant Impact		DIF Project
			Delay	LOS	Delay	LOS		Project Trips (1)	LOS (2)	
1	Cedar Avenue and Valley Boulevard	Bloomington (County)	130.2	F	140.5	F	60	YES	YES	NO
2	Cedar Avenue and I-10 Westbound Ramps	Bloomington (Caltrans)	16.9	B	19.6	B	40	NO	NO	YES
3	Cedar Avenue and I-10 Eastbound Ramps	Bloomington (Caltrans)	343.9	F	362.3	F	45	YES	YES	YES
4	Cedar Avenue and Cedar Place	Bloomington (County)	64.1	F	204.8	F	55	YES	YES	NO
5	Cedar Avenue and Orange Street	Bloomington (County)	103.1	F	113.4	F	65	YES	NO	NO
6	Cedar Avenue and Slover Avenue	Bloomington (County)	403.0	F	423.5	F	40	YES	YES	NO
7	Project Driveway and Orange Street	Bloomington (County)	N/A	N/A	13.0	B	50	N/A	N/A	NO
8	Linden Avenue and Slover Avenue	Bloomington (County)	22.8	C	30.9	D	20	NO	NO	NO

1. San Bernardino County Road Planning and Design Standards Section 10 Traffic Studies, dated April 20, 1993
2. San Bernardino County Interim Traffic Impact Study Guidelines Section 10.8 Determination of Impacts, dated April 9, 2014.

As shown in *Table 13* five (5) intersections are considered to be significantly impacted by the proposed project when utilizing the Current Significant Impact Threshold Guidelines. The intersections are considered to be impacted due to the number of trips added to the intersection based on the existing Level of Service as outlined in the *Table 3: Intersection Thresholds of Significance for Traffic Impact Studies* provided in *Chapter 2*. When utilizing the Interim Significant Impact Threshold Guidelines four (4) intersections are considered to be significantly impacted by the proposed project.

Although the intersection of Cedar Avenue and I-10 Westbound Ramps is considered to be impacted by the proposed project, the Current Significant Impact Threshold Guidelines identifies that in the event that an analysis indicates unsatisfactory Levels of Service on study area intersections a description of proposed improvements that return intersections to Level of Service "C" shall be included, except at locations where the County has already identified a project. As a result of this intersection being included in the SANBAG Rialto Sphere Nexus Study Development Impact Fee (DIF) program, the intersection is considered not to be significantly impacted by the proposed project.

Project specific improvements to the intersections of Cedar Avenue and Valley Boulevard and Cedar Avenue and Slover Avenue to bring the intersection back to the overall level of delay established prior to project traffic being added are outlined in *Chapter 3.2* and *Chapter 5.1*.

5.2 Year 2016 Regional Mitigations

To accommodate other area project traffic, specific traffic mitigations have been identified. The other area project specific mitigation consists of signaling the intersection of Linden Avenue and Slover Avenue.

1. Linden Avenue and Slover Avenue: Intersection improvements include signaling the intersection. The improvements are to be installed as other area projects develop. ***A fair share contribution will be provided for the intersection improvements.***
2. Cedar Avenue and Slover Avenue: Intersection improvements include widening the eastbound direction to accommodate an eastbound through lane. Convert the westbound right turn lane to a westbound shared through – right. Additionally optimize the signal timing for both the am and pm peak period to accommodate the additional capacity. The eastbound direction will be widened to accommodate a through lane. The westbound right will be restriped to a westbound shared through – right turn lane. The east, west, north, and southbound directions will provide a left turn lane, a through, and a shared through-right lane. ***The improvements identified at the intersection of Cedar Avenue and Slover Avenue is referenced from the Slover Avenue – Phase II Project provided by the county.***

5.3 Year 2035 Regional Mitigations

The County, in cooperation with the California Department of Transportation District 8 (Caltrans), proposes widening the existing Cedar Avenue overcrossing, the Union Pacific railroad (UPRR) overhead, and Cedar Avenue from four to six lanes; and realigning and widening the I-10 on- and off-ramps to connect to the improved Cedar Avenue and the addition of an auxiliary lane on the eastbound on- and off-ramps.

The County established a Development Impact Fee (DIF) to raise additional revenues, enabling the construction of necessary circulation system improvements. It also establishes a fair and equitable method of distributing costs of circulation system improvements to accommodate the traffic volumes generated by development.

1. Cedar Avenue and Valley Boulevard: Intersection improvements include widening along Cedar Avenue to accommodate additional lanes. An eastbound right turn lane will be converted to a through lane. The eastbound direction will provide two left turn lanes, two through lanes, and a right turn lane. The westbound direction will provide two left turn lanes, a through lane, and a shared through-right turn lane. The northbound direction will be widened to accommodate a through and right lane. The northbound approach will provide two left turn lanes, three through lanes, and two right turn lanes. The southbound direction will be widened to accommodate an additional through lane and the shared thought right turn lane is to be converted to a right turn only lane. The southbound approach will provide a left turn lane, three through lanes, and a right turn lane. ***A fair share contribution will be provided for the intersection improvements.***

2. Cedar Avenue and I-10 Westbound Ramps: Intersection improvements include widening at all approaches to accommodate additional lanes. The westbound direction will be widened to accommodate a left and a right turn lane. The westbound approach will provide a left turn lane, a shared left-through lane, and two right turn lanes. The northbound direction will be widened to accommodate a left and through lane. The northbound approach will provide two left turn lanes and three through lanes. The southbound direction will be widened to accommodate two through and a right turn lane. The southbound approach will provide five through lanes and two right turn lanes. **A Nexus Study lists projects which are funded by DIF. The SANBAG Rialto Sphere Nexus Study for the I-10 and Cedar Avenue Interchange Project include the mitigations identified for this intersection. As such the payment of the DIF will mitigate the project impacts**
4. Cedar Avenue and I-10 Eastbound Ramps: Intersection improvements include widening at each approach to accommodate additional lanes. The eastbound direction will be widened to accommodate a left and a right turn lane. The eastbound approach will provide two left turn lanes, a shared through-right lane, and a right turn lane. The northbound direction will be widened to accommodate two through and a right turn lane. The northbound approach will provide four through lanes and two right turn lanes. The southbound approach will be widened to accommodate a left and through lane. The southbound approach will provide two left turn lanes and three through lanes. **A Nexus Study lists projects which are funded by DIF. The SANBAG Rialto Sphere Nexus Study for the I-10 and Cedar Avenue Interchange Project include the mitigations identified for this intersection. As such the payment of the DIF will mitigate the project impacts.**
5. Cedar Avenue and Cedar Place: Intersection improvements include widening along Cedar Avenue to accommodate additional lanes and a striped median restricting left turn in and left turn out of Cedar Place. The eastbound direction will provide a shared right turn lane. The northbound direction will be widened to accommodate an additional through lane. The northbound approach will provide a three through lanes. The southbound direction will be widened to accommodate an additional through lane. The southbound approach will provide two through lanes and a shared through-right turn lane. **The mitigations identified for this intersection will be constructed as a part of the I-10 and Cedar Avenue Interchange Project.**
6. Cedar Avenue and Orange Street: Intersection improvements include widening along Cedar Avenue to accommodate additional lanes. The eastbound direction will provide a left turn lane and a shared through-right turn lane. The westbound direction will provided a shared left-through-right turn lane. The northbound direction will be widened to accommodate a through lane. The northbound approach will provide a left turn lane, two through lanes, and a shared through-right turn lane. The southbound right turn lane will be converted to a shared through-right lane. The southbound approach will provide a left turn lane, two through lanes and a shared through-right turn lane. **A fair share contribution will be provided for the intersection improvements.**

7. Cedar Avenue and Slover Avenue: Intersection improvements include widening at each approach to accommodate additional lanes. The eastbound direction will be widened to accommodate a left and through lane. The eastbound approach will provide two left turn lanes, a through lane, and a shared through-right lane. The westbound direction will be widened to accommodate a left and the right turn lane will be converted to a shared through-right turn lane. The westbound approach will provide two left turn lanes, a through lane, and a shared through-right lane. The northbound direction will be widened to accommodate a through lane. The northbound approach will provide a left turn lane, two through lanes, and a shared through-right lane. The southbound approach will be widened to accommodate a right turn lane. The southbound approach will provide a left turn lane, three through lanes, and a right turn lane. ***A fair share contribution will be provided for the intersection improvements.***
8. Linden Avenue and Slover Avenue: The County is currently in the design phase for Slover Phase 2 Improvements. The Slover Phase 2 improvements include widening along the east and westbound approaches. The eastbound approach will be widened to accommodate an additional through lane. The eastbound approach will provide a left turn lane, a through lane, and a shared through-right lane. The westbound approach will be widened to accommodate a left turn lane and a through lane. The westbound approach will provide a left turn lane, a through lane, and a shared through-right lane. The north and southbound approaches will continue to provide a shared left-through-right lane. The improvements are to be installed as Slover Phase 2 is implemented by the county. ***A fair share contribution will be provided for the intersection improvements.***

5.4 Fair Share Analysis

The following is an outline of the Fair Share mitigation for the above outline recommendations for traffic mitigation. The fair share percentage is calculated by intersection by peak period with project trips, as the numerator, and the total of the project trips and future development trips, as the denominator. This value is then converted into a percentage. The worst case, or higher percentage, fair share value is used to calculate the fair share cost. The Fair Share Contribution calculations and resulting contributions are outlined in *Table 14*, below.



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Table 14: Traffic Mitigation Fair Share
Traffic Study - High-Cube Warehouse/Distribution Center

Location	Fair Share				Improvement	Project Cost	Fair Share Cost
Cedar Avenue and Valley Avenue(1)	AM	$\frac{Project\ trips}{(Cumulative - Existing)}$	$\frac{60}{(5255 - 4930)}$	18.46%	Construct NB Through Lane	\$289,720	\$73,788
					Construct NB Right Turn Lane	\$50,000	
					Restripe SB Through Lane	\$20,000	
	PM	$\frac{Project\ trips}{(Cumulative - Existing)}$	$\frac{60}{(7310 - 6915)}$	15.19%	Restripe SB Right Turn Lane	\$20,000	
					Restripe EB Through lane	\$20,000	
					Total	\$399,720	
Cedar Avenue and Orange Avenue(2)	AM	$\frac{Project\ trips}{((Future + Project) - Existing)}$	$\frac{60}{(3065 - 1830)}$	4.86%	Construct NB Through Lane	\$289,720	\$71,271
					Construct SB Through Lane	\$289,720	
	PM	$\frac{Project\ trips}{((Future + Project) - Existing)}$	$\frac{75}{(3830 - 3220)}$	12.30%			
					Total	\$579,440	
Cedar Avenue and Slover Avenue(2)	AM	$\frac{Project\ trips}{((Future + Project) - Existing)}$	$\frac{40}{(3420 - 2525)}$	4.47%	Construct NB Through Lane	\$289,720	\$166,525
					Construct SB Right Turn Lane	\$50,000	
					Construct EB Left Turn Lane	\$50,000	
					Construct EB Through Lane	\$289,720	
	PM	$\frac{Project\ trips}{((Future + Project) - Existing)}$	$\frac{40}{(4270 - 4090)}$	22.22%	Construct WB Left Turn Lane	\$50,000	
					Construct WB Through Lane	\$20,000	
					Total	\$749,440	
Linden Avenue and Slover Avenue(2)	AM	$\frac{Project\ trips}{((Future + Project) - Existing)}$	$\frac{20}{(1640 - 850)}$	2.53%	Traffic Signal	\$600,000	\$15,780
	PM	$\frac{Project\ trips}{((Future + Project) - Existing)}$	$\frac{20}{(2045 - 1285)}$	2.63%			
Total Fair Share Cost =							\$ 327,364

(1) Hybrid Fair-Share Calculation

(2) Conventional Fair-Share Calculation

Source: David Evans and Associates, Inc.

The fair share calculation denoted with a 1 represents a hybrid fair share calculation for the intersection of Cedar Avenue at Valley Boulevard. The equation for the hybrid fair share calculation is provided in Table 14. The equation is the percentage resulting from the Project Trips divided by the difference of the Cumulative Volume (Existing + Ambient + Project + Cumulative Project Volume) and Existing Volumes. The need for this hybrid fair share calculation resulted from the Future Volumes being lower than the Existing Volume and in using the conventional fair share calculation a negative number is achieved. Utilizing the equation for the hybrid fair share calculation the fair share percentage is **18.46%** and 15.19% as opposed to the -5.61% and -2.74% calculated with the equation for the conventional fair share calculation. The resulting fair share contribution for the intersection of Cedar Avenue at Valley Boulevard is \$73,788.

The fair share calculation denoted with a 2 represents the conventional fair share calculation utilized for the intersections of Cedar Avenue at Orange Avenue, Cedar Avenue at Slover Avenue, and Linden Avenue at Slover Avenue. The equation for the conventional fair share calculation is provided in Table 14. The equation is the percentage resulting from the Project Trips divided by the difference of the Future with Project Traffic Volume and Existing Volumes.

The fair share percentage for the intersection of Cedar Avenue at Orange Avenue is 4.86% and **12.30%** resulting in a contribution of \$71,271.

The fair share percentage for the intersection of Cedar Avenue at Slover Avenue is 4.47% and **22.22%** resulting in a contribution of \$166,525.

The fair share percentage for the intersection of Linden Avenue at Slover Avenue is 2.53% and **2.63%** resulting in a contribution of \$15,780.

The resulting total fair share cost is \$327,364.

5.5 Development Impact Fee (DIF)

The following is an outline of the Development Impact Fee (DIF) calculation for the above outline recommendations for traffic mitigation. The DIF is calculated by the predominate use of the building or structure and calculated on the total square footage of the building or structure. The DIF Contributions are provided in *Table 15* per the Rialto Plan Subarea.

Table 15: Traffic Mitigation DIF
Traffic Study - High-Cube Warehouse/Distribution Center

<u>Project</u>	<u>Fee for High Cube per Square Foot</u>	<u>Contribution</u>
High-Cube Warehouse/Distribution Center		
371,422 Sq Ft Gross Floor Area	\$1.82	\$676,000
Total DIF		\$676,000



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5.6 Capacity Analysis Summary

The following is a summary of the delay and LOS for each study intersection for all scenarios. The capacity analysis summaries are provided in *Table 16* for the AM Peak Hour and *Table 17* for the PM Peak Hour.

Table 16: Capacity Analysis Summary AM Peak Hour Comparison Table
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection	Existing Condition		Year 2016 Ambient Condition		Year 2016 Ambient + Project Condition with Mitigations		Year 2016 Cumulative Condition		Year 2016 Cumulative Condition with Mitigations		Year 2035 Ambient Condition		Year 2035 Ambient Condition with Mitigations		Year 2035 Ambient + Project Condition	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1 Cedar Avenue and Valley Boulevard(1)	57.3	E	60.6	E	63.2	E	52.6	D	68.7	E	238.4	F	39.5	D	52.9	D
2 Cedar Avenue and I-10 Westbound Ramps(2)	21.2	C	24.8	C	26.9	C	-	-	45.4	D	81.1	F	24.0	C	14.3	B
3 Cedar Avenue and I-10 Eastbound Ramps(2)	220.5	F	232.9	F	235.2	F	-	-	262.5	F	135.4	F	22.8	C	27.3	C
4 Cedar Avenue and Cedar Place(1)	30.7	D	35.8	E	59.6	F	13.3	B	127.3	F	954.3	F	30.4	D	43.1	E
5 Cedar Avenue and Orange Street(1)	10.5	B	10.8	B	11.3	B	25.7	C	12.0	B	111.3	F	19.3	B	46.7	D
6 Cedar Avenue and Slover Avenue(1)	116.7	F	124.7	F	127.6	F	48.7	D	205.1	F	464.6	F	55.4	D	51.1	D
7 Project Driveway and Orange Street (1)	-	-	-	-	12.4	B	11.3	B	12.4	B	-	-	-	-	9.5	A
8 Linden Avenue and Slover Avenue(1)	12.8	B	13.8	B	14.3	B	-	-	18.2	C	54.1	F	15.7	B	15.7	B

(1) The intersection is under the County Jurisdiction of the unincorporated community of Bloomington

(2) The intersection is under the Caltrans Jurisdiction within the unincorporated community of Bloomington

(-) Not Applicable to the analysis scenario

Denoted in bold are intersections exceeding the Level of Service threshold



Table 17: Capacity Analysis Summary PM Peak Hour Comparison Table
Traffic Study - High-Cube Warehouse/Distribution Center

Intersection	Existing Condition			Year 2016 Ambient Condition			Year 2016 Ambient + Project Condition			Year 2016 Ambient + Project Condition with Mitigations			Year 2016 Cumulative Condition			Year 2016 Cumulative Condition with Mitigations			Year 2035 Ambient Condition			Year 2035 Ambient Condition with Mitigations			Year 2035 Ambient + Project Condition		
	Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS		Delay	LOS	
1 Cedar Avenue and Valley Boulevard(1)	130.2	F		137.4	F		140.5	F		121.5	F		152.1	F		132.9	F		313.4	F		58.1	E		63.3	E	
2 Cedar Avenue and I-10 Westbound Ramps(2)	16.9	B		18.6	B		19.6	B		-	-		62.9	E		-	-		137.1	F		24.8	C		24.8	C	
3 Cedar Avenue and I-10 Eastbound Ramps(2)	343.9	F		358.9	F		362.3	F		-	-		399.9	F		-	-		113.3	F		27.2	C		29.3	C	
4 Cedar Avenue and Cedar Place(1)	64.1	F		100.3	F		204.8	F		15.1	C		270.0	F		16.4	C		196.0	F		18.4	C		20.9	C	
5 Cedar Avenue and Orange Street(1)	103.1	F		113.2	F		113.4	F		112.5	F		178.6	F		176.3	F		111.9	F		14.7	B		26.0	C	
6 Cedar Avenue and Slover Avenue(1)	403.0	F		420.7	F		423.5	F		274.4	F		509.6	F		334.7	F		537.6	F		78.5	E		72.9	D	
7 Project Driveway and Orange Street (1)	-	-		-	-		13.0	B		11.6	B		13.0	B		11.6	B		-	-		-	-		9.6	A	
8 Linden Avenue and Slover Avenue(1)	22.8	C		28.2	D		30.9	D		-	-		36.7	E		14.4	B		54.0	F		10.2	B		10.8	B	

(1) The intersection is under the County Jurisdiction of the unincorporated community of Bloomington

(2) The intersection is under the Caltrans Jurisdiction within the unincorporated community of Bloomington

(-) Not Applicable to the analysis scenario

Denoted in bold are intersections exceeding the Level of Service threshold

6 APPENDICES

Appendix A.	Scope Memo/Memorandum of Understanding
Appendix B.	Model Plots
Appendix C.	I-10 and Cedar Avenue Interchange Improvement Plans
Appendix D.	Slover Avenue Phase II Plans
Appendix E.	Other Area Projects
Appendix F.	Intersection Capacity Analysis Calculations